

## **REMARKS**

Claims 1-14 and 21-25 are all the claims pending in the application. Claims 1-14 stand rejected on prior art grounds; claims 15-20 have been cancelled without prejudice or disclaimer; and, claims 21-25 have been added. Applicants respectfully traverse these rejections based on the following discussion.

### **I. The Prior Art Rejections**

Claims 1-7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Long, et al. (U.S. Patent No. 5,831,836), hereinafter referred to as Long. Claims 8-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Howell (U.S. Patent No. 6,605,526 B1). Applicants respectfully traverse these rejections based on the following discussion.

The claimed invention provides an integrated circuit structure comprising a pad having a wirebond connection region and a probe pad region, and an inspection mark between the wirebond connection region and the probe pad region. In the rejection, the Office Action argues that Long and Howell disclose many features of the claimed invention. However, Long discloses a pad within a lower conductive layer, which is below an upper insulative layer. Moreover, the electrical leads and the wires are outside of the pad in Long. Therefore, Long fails to disclose a pad *on* said insulator layer, said pad *having* a wirebond connection region and a probe pad region. In addition, the asserted inspection mark of Long is not between the wire and the electrical leads; and, the opening is not in the upper insulative layer (the opening is in the lower conductive layer). Furthermore, Applicants submit that Howell teaches “eliminat[ing] the need for additional structures such as conductive pads”. Therefore, as explained in greater detail

below, Applicants respectfully submit that the prior art of record does not teach or suggest the claimed invention.

The Office Action argues that Long discloses “a pad ... on said insulator layer, said pad having a wirebond connection region and a probe pad region” (Office Action, p. 3, para. 5). Such features are defined in independent claims 1, 8, and 21 using identical language.

First of all, Applicants submit that unlike the claimed invention, Long teaches that the pad 118 is below the insulative layer 114. More specifically, as described in column 3, lines 1-4 and 51-52, and as shown in FIG. 1 of Long, a semiconductor device package of this invention 110 includes a flexible substrate 112 having an *upper* patterned *insulative layer 114*, and a *lower* patterned conductive layer 116. The lower patterned conductive layer 116 is patterned to provide a die attach *pad 118*. Therefore, it is Applicants position that the pad 118 is within the lower conductive layer 116 and is below the upper insulative layer 114. Thus, the pad 118 is not “on” the insulative layer 114.

Secondly, Applicants submit that Long does not disclose that the pad 118 has the wire 122 (which the Office Action argues teaches the claimed wirebond connection region) and the electrical leads 117 (which the Office Action argues teaches the claimed probe pad region). As illustrated in Figure 1 of Long, the wire 122 and electrical leads 117 are not contained within the pad 118. Therefore, it is Applicants’ position that Long fails to teach the claimed feature of a “pad having a wirebond connection region and a probe pad region” (independent claims 1, 8, and 21).

Moreover, as described in column 4, lines 1-10 of Long, a plurality of electrical *leads 117* extend between the *periphery of the die attach pad 118* and the periphery of the completed

package 110. *At or surrounding the periphery of the die attach pad 118, the electrical leads 117* are connected to the integrated circuit die 120. When the integrated circuit die 120 is electrically connected using wire bonding, a plurality of thin conductive wires 122 are positioned between circuit outputs on the integrated circuit die 120 and the electrical leads 117 of the flexible substrate to provide the electrical connection.

Accordingly, Applicants submit that because the electrical leads 117 are at or surrounding the periphery of the pad 118, the pad 118 does not have the electrical leads 117. The electrical leads 117 are separated from the pad 118 via the die 120 (which is on the pad 118) and the wires 122 (which connect the die 120 to the electrical leads 117). The pad 118 does not have the electrical leads 117 and the wires 122; rather, the electrical leads 117 and the wires 122 are outside of the pad 118, wherein the electrical leads 117 and the wires 122 are separated from the pad 118 via the die 120. Therefore, it is Applicants' position that Long fails to disclose the claimed feature of "a pad ... on said insulator layer, said pad having a wirebond connection region and a probe pad region" as defined in independent claims 1, 8, and 21.

In addition, the Office Action argues that Long discloses "an inspection mark between said wirebond connection region and said probe pad region" (Office Action, p. 3, para. 5). Such features are defined in independent claims 1, 8, and 21 using identical language. As discussed above, the Office Action argues that the wire 122 and the electrical leads 117 of Long teach the wirebond connection region the probe pad region, respectively, of the claimed invention (Office Action, p. 3, para. 5). Moreover, the Office Action argues that item 115 teaches the inspection mark of the claimed invention (Office Action, p. 3, para. 5).

However, as illustrated in Figure 1 of Long, the item 115 is not between the wire 122 and the electrical leads 117. Therefore, it is Applicants' position that Long fails to disclose the claimed feature of "an inspection mark between said wirebond connection region and said probe pad region" as defined in independent claims 1, 8, and 21.

Furthermore, the Office Action argues that Long discloses that "said inspection mark comprises an opening in said insulator layer" (Office Action, p. 3, para. 5). Such features are defined in independent claims 1, 8, and 21 using identical language.

More specifically, the Office Action argues that item 15a in the drawing illustrated on page 4 of the Office Action discloses the "opening in said insulator layer" (Office Action, p. 3, para. 5 – p. 4, para. 1). However, the drawing shows that the opening 15a is NOT in the *upper insulative layer 114*. Instead, the opening 15a is in the *lower conductive layer 116*. Therefore, it is Applicants' position that Long fails to disclose the claimed feature of "an opening in said insulator layer that is filled with said conductive material" as defined in independent claims 1, 8, and 21.

Additionally, the Office Action argues that Howell discloses a pad on the insulator layer (Office Action, p. 5, para. 4). Such a feature is defined in independent claims 1, 8, and 21 using the following language: "a pad comprising a conductive material on said insulator layer, said pad having a wirebond connection region and a probe pad region".

In support of this contention, the Office Action cites column 1, lines 21-31, of Howell. Specifically, the cited portion of Howell discloses that copper is not a self-passivating metal and easily corrodes when left exposed. Therefore, it is *conventionally* necessary to form protective pads or other permanent conductive features over the copper wiring to prevent corrosions of the

exposed copper. These pads are typically made of a less corrosion susceptible or self-passivating material such as tungsten, titanium, tantalum, aluminum, etc. *The inclusion of protective pads in the structure is undesirable* because of the additional materials, processing steps, and manufacturing complexity which potentially decrease die yield.

Furthermore, as described in the following paragraph of Howell, “[t]he invention described below overcomes the problems of conventional structures and processes ... This *eliminates the need for additional structures such as conductive pads*, yet still protects the copper from corrosion” (col. 1, lines 32-38 (emphasis added)).

Accordingly, Applicants submit that because the claimed invention defines “a pad ... on said insulator layer” and Howell teaches “eliminat[ing] the need for additional structures such as conductive pads” (col. 1, lines 36-37), Howell teaches away from Applicants invention. Because Howell discloses “eliminat[ing] the need for additional structures such as conductive pads” (col. 1, lines 36-37), it is Applicants’ position that Howell fails to teach the claimed feature of “a pad comprising a conductive material on said insulator layer, said pad having a wirebond connection region and a probe pad region” as defined in independent claims 1, 8, and 21.

Further, Applicants submit that that Long fails to disclose the claimed feature “wherein said probe pad region is adapted to make physical contact with a probe” as defined by independent claims 1, 8, and 21. As discussed above, the Office Action asserts that the electrical leads 117 of Long teach the claimed probe pad region (Office Action, p. 3, para. 5). However, the electrical leads 117 are not adapted to make physical contact with a probe.

In addition, Applicants submit that that Long fails to disclose the claimed features “wherein said inspection mark is visible from an exterior of said integrated circuit structure” and

“wherein said inspection mark delineates where probe inspection marks are permitted on said pad” as defined by independent claim 21 and dependent claims 6, 7, 13, and 14. As discussed above, the Office Action asserts that item 115 of Long teaches the inspection mark of the claimed invention (Office Action, p. 3, para. 5). However, the item 115 does not delineate where probe inspection marks are permitted on the pad; and, the item 115 is not visible from an exterior of the integrated circuit structure. As illustrated in Figure 1 of Long, the item 115 is covered by items 122, 128, and 130.

Therefore, it is Applicants’ position that Long and Howell do not teach or suggest many features defined by independent claims 1, 8, and 21, and that such claims are patentable over the prior art of record. Further, it is Applicants’ position that dependent claims 2-7, 9-14 and 22-25 are similarly patentable, not only because of their dependency from a patentable independent claims, but also because of the additional features of the invention they defined. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

## **II. Formal Matters and Conclusion**

In view of the foregoing, Applicants submit that claims 1-14 and 21-25, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to

discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

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/Duane N. Moore/  
Duane N. Moore  
Registration No. 53,352

Gibb I.P. Law Firm, LLC  
2568-A Riva Road, Suite 304  
Annapolis, MD 21401  
Voice: (410) 573-6501  
Fax: (301) 261-8825  
Customer Number: 29154